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EXAMINER

WOO, ISAAC M

ART UNIT

PAPER NUMBER

2172

DATE MAILED: 02/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/614,369

Applicant(s)

CHOY ET AL

Examiner

Isaac M Woo

Art Unit

2172

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to Applicant's amendments, filed on November 22, 2002 have been considered but they are not persuasive.
2. The applicant amended claims 1, 5, 11 and 15. And the pending claims are 1-19.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4 and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vijaykumar (U.S. Patent No. 5,745,896) in view of Sarkar (U.S. Patent No. 6,012,067).

With respect to claim 1, Vijaykumar discloses, RDBMS (col. 3, lines 44-25) providing referential integrity (col. 3, lines 26-62, col. 9, lines 34-67) for homogenous links, see (FIG. 1C, col. 7, lines 10-67 to col. 8, lines 1-57, Note: the "homogeneous link" defined by applicant in specification (page 1, lines 18-19 to page 2, line 1) that all links point to tuples in a single predetermined target table. And Vijaykumar (180, index,

Art Unit: 2172

FIG.1C) points to the single predetermined database table (170, FIG. 1C). Vijaykumar discloses the software layer maintaining at least one data structure useful in ensuring referential integrity, see (col. 3, lines 26-62). Vijaykumar does not explicitly disclose the software layer on top of the RDBMS for causing the RDBMS to provide referential integrity for heterogeneous link. However, Sarkar discloses the software layer on top of the RDBMS (col. 1, lines 5-49) for causing the RDBMS to provide referential integrity (FIG. 5, col. 10, lines 7-29) for heterogeneous link, (col. 3, lines 46-67 to col. 4, lines 1-14), see (col. 1, lines 5-49, col. 5, lines 6-67 to col. 6, lines 1-9). The heterogeneous links that point to a target table representing another particular type of document, (i.e., image, from applicant's specification on page 2, lines 1-14), as defined by applicant. Sarkar teaches the relational database management provides referential integrity for heterogeneous links (i.e., links to heterogeneous data objects i.e., text, audio, video, image, col. 5, lines 6-67). Therefore, it would have been obvious a person having ordinary skill in the art to combined the system of Vijaykumar with that of Sarkar to include the software layer on top of the RDBMS for causing the RDBMS to provide referential integrity for heterogeneous links. The referential integrity provides correct dependency relationship in relational database management system, which can avoid dangling point and the heterogeneous links to point different types of data between databases, which can provides and stores huge different types of data. Thus, it would be beneficial to use the referential integrity for heterogeneous links to maintain data dependencies and handle huge different types of data.

With respect to claim 2, Vijaykumar discloses that the software layer maintains at least one table, see (FIG. 1C, col. 7, lines 9-59).

With respect to claims 3 and 18, Vijaykumar discloses that the table is accessed upon an attempted deletion or updating of a tuple references by a link, and the attempted deletion or updating is selectively disallowed base on the table, see (col. 3, lines 16-67).

With respect to claims 4 and 19, Vijaykumar discloses that the software layer includes at least one stored procedure accessible by an application to insert, update, or delete a tuple while ensuring referential integrity in heterogeneous links associated with the tuple, see (col. 3, lines 16-67, col. 14, lines 11-32, col. 15, lines 65-667 to col. 16, lines 1-32).

With respect to claim 15, Vijaykumar discloses, RDBMS (col. 3, lines 44-25) providing referential integrity (col. 3, lines 26-62, col. 9, lines 34-67) for homogenous links, see (FIG. 1C, col. 7, lines 10-67 to col. 8, lines 1-57, Note: the "homogeneous link" defined by applicant in specification (page 1, lines 17-1 to page 2, line 1) that all links point to tuples in a single predetermined target table. Vijaykumar discloses RDBMS , see (col. 3, lines 16-62). Vijaykumar does not explicitly disclose software ware layer on top of the RDBMS for causing RDBMS to support triggers, using at least one table (abstract, col. 1, lines 16-67 to col. 2, lines 1-58). However, Sakar discloses that

database schema provides triggers, see (col. 11, lines 26-65, col. 3, lines 46-67).

Therefore, it would have been obvious a person having ordinary skill in the art to include that the RDBMS supports triggers. The action causes the automatic invocation of a procedure by trigger, for instance to preserve referential integrity. A triggers goes into effect when a user attempts to modify data with an insert, delete, or update command. A trigger can instruct the system to take any number of actions when a specified change is attempted. By preventing incorrect, unauthorized, or inconsistent changes to data, triggers help maintain the integrity of the database. Thus, it would be beneficial to use a trigger to keep the integrity of the database.

With respect to claim 16, Sarkar discloses that the software layer maintains at least one table and establishes at least one trigger, see (col. 3, lines 46-67).

With respect to claim 17, Sarkar discloses that the software layer establishes at least one of: a delete trigger, and an update trigger, see (col. 7, lines 10-67 to col. 8, lines 1-67 to col. 9, lines 1-31).

5. Claims 5-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarkar (U.S. Patent No. 6,012,067).

With respect to claim 5, Sarkar discloses, providing at least one table (FIG. 3, FIG. 4, FIG. 5, FIG. 7, col. 9, lines 31-67 to col. 10, lines 1-30, col. 10, lines 46-61), in a

Art Unit: 2172

non-RDBMS element communicating with at least one RDBMS (FIG. 5, col. 10, lines 7-29, FIG. 1, col. 6, lines 56-67 to col. 7, lines 1-9, col. 2, lines 50-67 to col. 3, lines 1-45), at least one table having scoped link column (FIG. 2, col. 7, lines 10-67 to col. 8, lines 1-64, FIG. 7, col. 10, lines 46-61), the table being associated with the scoped link column, see (FIG. 7, col. 10, lines 46-61); and

accessing the table to ensure referential integrity in an RDBMS, see (FIG.5, col. 10, lines 7-30). Sarkar does not explicitly disclose heterogeneously scoped link (HSL) table and heterogeneously scoped link column. However, Sarkar teaches all the Table column E (heterogeneously scoped link column) point to different data type (any objects, i.e., image, text, ...) from the FIG. 2, and FIG. 7 which shows the Table S has heterogeneous (image, text,...) links. Therefore, it would have been obvious a person having ordinary skill in the art to include the heterogeneously scoped link (HSL) and heterogeneously scoped link column into the system of Sarkar to provide any kind of data. The heterogeneously scoped link can provide huge different data types logically, which improve the management for RDBMS.

With respect to claim 6, Sarkar discloses that the HSL table is accessed when a link attribute is sought to be changed, see (FIG. 2, col. 7, lines 10-67 to col. 8, lines 1-67 to col. 9, lines 1-31).

With respect to claim 7, Sarkar discloses that the HSL table is accessed when a tuple is sought to be changed or deleted, see (FIG. 2, col. 7, lines 10-67 to col. 8, lines 1-67 to col. 9, lines 1-31).

With respect to claim 8, Sarkar discloses that the HSL table is established by an RI table, see (FIG. 5, col. 10, lines 7-29).

With respect to claim 9, Sarkar discloses that at least one trigger useful in selectively disallowing operations, see (col. 10, lines 46-62).

With respect to claim 10, Sarkar discloses that at least one procedure accessible by an application to insert, update, or delete a tuple while ensuring referential integrity in heterogeneous links associated with the tuple, see (col. 10, lines 7-62, col. 7, lines 10-67 to col. 8, lines 1-38).

With respect to claim 11, Sarkar discloses the computer program product including computer usable code means programmed with logic for ensuring referential integrity in an RDBMS (col. 1, lines 6-67 to col. 2, lines 1-67) having at least one column, computer readable code means for maintaining a tables, see (FIG. 2, FIG. 7, col. 7, lines 10-67 to col. 8, lines 1-67 to col. 9, lines 1-31) in a software layer not part of the RDBMS, see (FIG. 1, col. 6, lines 56-67 to col. 7, lines 1-9, col. 2, lines 50-67 to col. 3, lines 1-45); and

Art Unit: 2172

computer readable code means for using the table to ensure that operations on tuples (FIG. 2, FIG. 7, col. 7, lines 10-67 to col. 8, lines 1-67 to col. 9, lines 1-31). Sarkar does not explicitly disclose the operation on tuples do not result in a heterogeneous scoped link pointing to no tuple. However, Sarkar teaches the referential integrity which means that the referential integrity has no dangling pointer (pointing to no tuple), see (col. 10, lines 7-62). The reference that doesn't actually lead anywhere is dangling point (pointing no tuple) In C and some other languages, a pointer that doesn't actually point at anything valid. Therefore, it would have been obvious a person having ordinary skill in the art to include the operation on tuples do not result in a heterogeneous scoped link pointing to no tuple into the system of Sarkar. A data dependency that must remain true for a database to preserve integrity. The data dependency are specified at database creation time and enforced by the database management system. Thus, referential integrity provides no dangling point (pointing to no tuple), which improves database management.

With respect to claim 12, Sarkar discloses that the computer readable code means for establishing at least one trigger useful in cooperation with the table for selectively disallowing operations, see (col. 3, lines 45-67 to col. 4, lines 1-65).

With respect to claim 13, Sarkar discloses that the computer readable code means for establishing at least one trigger; delete trigger, and an update trigger, see (col. 10, lines 7-61).

With respect to claim 14, Sarkar discloses that the computer readable code means for inserting, updating, or deleting a tuple while ensuring referential integrity in heterogeneous links associated with the tuple, see (col. 7, 8, col. 10, lines 7-61).

Response to Amendment

6. In response to Applicant's remarks filed on November 22, 2002, the following factual arguments are noted:

a, Vijaykumar does not disclose or suggest the contemplating heterogeneous links.

b, Sarkar does not disclose or suggest the software layer that has a data structure for maintaining referential integrity.

In considering a, Vijaykumar only teaches the referential integrity for homogeneous links. But Sarkar discloses the referential integrity for heterogeneous links from efficient relational database management systems to a) support distributed object paradigm for business application logic and b) support heterogeneous data over the internet (col. 4, lines 66-67 to col. 5, lines 1-5). And common features are scalability, security, transaction management, concurrency and serialization, state management with persistence, exception/fault resolution, composite object creation with multiple components, object life cycle management including transparent persistence, dynamic

location of objects and referential integrity (col. 2, lines 50-67). Thus, combining of two, teaches referential integrity for homogeneous links and heterogeneous links.

In considering b, Vijaykumar discloses that for maintaining integrity between data tables. The system includes a preferred interface for defining referential integrity links between data tables. In particular, during the process of creating or restructuring a table, the system provides a referential integrity dialog box which allows the user to define a referential relationship between two tables. In operation, the user selects a field from the child table (i.e., the one he or she is creating or restructuring), and then selects a table containing all valid values for the selected field (i.e., the table to serve as the parent or reference table). In this manner, users may quickly specify a referential integrity link between data tables. Defining a referential integrity rule assures that all related records are handled by the system in a consistent manner during data entry (or modification), see (col. 3, lines 15-62), which teaches that the table (data structure) maintains the referential integrity based on software instructions.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isaac M Woo whose telephone number is (703) 305-0081. The examiner can normally be reached on 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Y Vu can be reached on (703) 305-4393. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 308-6606 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

IMW
February 6, 2003


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